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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/677,316

10/03/2003

Tatsuya Arao

740756-2655

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05/17/2006

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EXAMINER

TRAN, THIEN F

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

11A

Office Action Summary	Application No. 10/677,316	Applicant(s) ARAO, TATSUYA	
	Examiner Thien F. Tran	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-69 is/are pending in the application.
- 4a) Of the above claim(s) 59-63 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 19-42, 51-58, 66, 67 and 69 is/are allowed.
- 6) ☒ Claim(s) 1-7, 10-16, 43-47, 50, 64, 65 and 68 is/are rejected.
- 7) ☒ Claim(s) 8, 9, 17, 18, 48 and 49 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) ☐ Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) ☐ Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4-7, 10, 13-16, 43, 46-47, 50, 64-65, 68 are rejected under 35 U.S.C. 102(b) as being anticipated by Ogura et al. (US 6,255,166).

Ogura et al. disclose a semiconductor device (Figure 13) comprising: a semiconductor layer (101) formed on an insulating surface (col. 5, lines 50-53) and the semiconductor layer comprising a channel forming region (212L, 211, 212R); a first insulating film (132L, 131, 132R) formed on the semiconductor layer, said first insulating film formed to cover an entire surface of the channel forming region; a gate electrode (242R) characterized as a first auxiliary electrode formed over the semiconductor layer with the first insulating film interposed therebetween; a second insulating film (131c) formed on and in contact with the first insulating film (132L, 131, 132R) and the first auxiliary electrode (242R); and a gate electrode (241) formed over the channel forming region with the first insulating film and the second insulating film interposed therebetween, wherein the first auxiliary electrode is formed outside of the channel forming region. It is noted that the first insulating film in the claim does not require the film formed of homogeneous material and uniform thickness.

Regarding claims 4, 13 and 46, the first auxiliary electrode (242R) is partially overlapped with the gate electrode (241) with the second insulating film (131c) interposed therebetween.

Regarding claims 5, 14, the first auxiliary electrode (242R) is formed between the channel forming region and a drain region (222) in the semiconductor layer.

Regarding claims 6 and 15, a second auxiliary electrode (242L) is formed over the semiconductor layer with the first insulating film (132L) interposed therebetween, and the second auxiliary electrode is formed between a source region (221) and the channel forming region in the semiconductor layer.

Regarding claims 7 and 16, an impurity element (n-type) is included in a portion (222) of the semiconductor layer opposed to the first auxiliary electrode through the first insulating film (132).

Regarding claims 10, 50, the claim limitations "for controlling the carrier density between a source region or a drain region, and the channel forming region" in claim 10, "controls the carrier density between the source region, the drain region, and the first region" in claim 50 are functional language and are nonlimiting since it has been held that claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990). A claim containing a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the

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prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). Also, the first auxiliary electrode (242R) located between the drain region and the channel forming region inherently controls the carrier density between a drain region (222) and the channel forming region in the semiconductor layer.

Regarding claim 43, the semiconductor layer (101) comprises a first region (211), a second region (212R), a source region (221), and a drain region (222); and the gate electrode (241) is formed over the second insulating film, wherein the first region (211) overlaps with the gate electrode (241) with the first insulating film and the second insulating film interposed therebetween, and does not overlap with the first auxiliary electrode, wherein the first region (211) is formed between the source region (221) and the drain region (222), the second region (212R) is formed between the first region and the drain region (222), and the first auxiliary electrode (242R) is formed over the second region with the first insulating film interposed therebetween.

Regarding claim 47, an impurity element (p-type dopants) is included in the second region.

Regarding claims 64, 65 and 68, a first distance between the outer portion of the gate electrode (241) and the semiconductor layer is longer than a second distance between the first auxiliary electrode (242R) and the semiconductor layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-3, 11-12, 44-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogura et al. (US 6,255,166).

Ogura et al. as described above disclose the first insulating film (132L, 131, 132R) having a thickness in the claimed range but do not disclose the second insulating film (131c) having a thickness of 5 to 100 nm. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the second insulating film having the thickness as claimed, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Allowable Subject Matter

Claims 19-42, 51-58, 66-67 and 69 are allowed.

Claims 8-9, 17-18, 48 and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 02/15/2006 have been fully considered but they are not persuasive. Claimed structure is anticipated and obvious over Ogura et al. as described above.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F. Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tt
May 10, 2006


Thien Tran
Primary Examiner